REMARKS

Claims 1-34 are pending with claims 1, 5, 6, 8, 9, 15 and 16 being independent. Claims 1-4, 8-14, 20-22, 24-28 and 32-34 were previously withdrawn from consideration. Claims 5, 6, 15 and 16 have been amended.

Independent claims 5 and 6 and dependent claims 7 and 23 have been rejected as being unpatentable over Shimizu (U.S. Patent No. 5,753,541). Claim 5, as amended, recites a method of manufacturing a semiconductor device including the step of "forming a first amorphous semiconductor film comprising *silicon and germanium* on an insulating surface wherein a concentration of germanium is within a range of *0.1 atom% to 10 atom%*" (emphasis added). Claim 6 recites formation of a film having the same properties on an insulating film. Applicant requests reconsideration and withdrawal of the rejection of claims 5 and 6 and their dependent claims because Shimizu does not describe or suggest the claimed step of forming an amorphous semiconductor film including silicon and germanium at the specified concentration range.

Shimizu describes a method of fabricating a thin field effect transistor on a glass substrate 1 including the steps of forming a silicon nitride layer 1a, an amorphous silicon layer 5a, and an amorphous germanium layer 6a on the glass substrate 1 (Fig. 1, col. 5, lines 18-32). The amorphous germanium layer does not include silicon and, accordingly, is not a "silicon and germanium" film. Moreover, since the film is made from germanium, it includes germanium well in excess of the recited range of "0.1 atom% to 10 atom%."

Accordingly, Shimizu does not describe or suggest the claimed amorphous silicon and germanium layer, and for at least this reason, applicants request withdrawal of the rejection of claims 5 and 6, and the claims that depend from them.

Independent claims 15 and 16 and dependent claims 17 and 29 have been rejected as being unpatentable over Shimizu in view of Teramoto (U.S. Patent No. 5,923,966).

Claim 15, as amended, recites a method of manufacturing a semiconductor device including the step of "forming a first amorphous semiconductor film including silicon and germanium on an insulating surface wherein a concentration of the germanium is within a range of 0.1 atom% to 10 atom%." Shimizu and Teramoto, neither alone nor in combination, describe

or suggest forming the recited amorphous silicon and germanium film. As discussed above in reference to claims 5 and 6, Shimizu does not describe or suggest forming such a film. Teramoto describes a laser processing apparatus used to crystallize amorphous silicon films. Teramoto also does not describe or suggest forming the recited silicon and germanium film. For at least these reasons, applicant requests reconsideration and withdrawal of the rejection of claim 15 and its dependent claim 17.

Claim 16, as amended, recites a method of manufacturing a semiconductor device including the step of "forming a first amorphous semiconductor film including silicon and an element having a larger atomic radius than silicon on an insulating surface wherein a concentration of said element is within a range of 0.1 atom% to 10 atom%." For the reasons noted above, Shimizu and Teramoto, either alone nor in combination, fail to describe or suggest formation of the recited film. Accordingly, for at least these reasons, applicant requests reconsideration and withdrawal of the rejection of claim 16 and its dependent claim 29.

Dependent claims 19 and 31 have been rejected as being unpatentable over Shimizu in view of Teramoto and further in view of Zhang (U.S. Patent No. 5,578,520). Claims 19 and 31 depend from claims 15 and 16, respectively. As discussed above in reference to claims 15 and 16, neither Shimizu, Teramoto, nor any combination of the two describes or suggests forming the first amorphous semiconductor film recited in claims 15 and 16. Zhang does not remedy the deficiencies of Shimizu and Teramoto. Zhang describes a method for annealing a semiconductor that includes thermally annealing an amorphous semiconductor in a vacuum or inactive atmosphere and then crystallizing the amorphous semiconductor by exposing it to a laser light. Zhang, however, does not describe or suggest forming an amorphous semiconductor film that includes silicon and germanium, wherein the germanium is concentrated within a range of 0.1 atom% to 10 atom%, as recited in claim 15. Zhang also does not describe or suggest forming an amorphous semiconductor film that includes silicon and an element having a larger atomic radius than silicon, wherein the element is concentrated within a range of 0.1 atom% to 10 atom%, as recited in claim 16. Accordingly, for at least these reasons, applicant requests reconsideration and withdrawal of the rejection of claims 19 and 31.

Dependent claims 18 and 30 have been rejected as being unpatentable over Shimizu in view of Teramoto and further in view of Maekawa (U.S. Patent No. 6,066,547). Claims 18 and

30 depend from claims 15 and 16, respectively. As discussed above in reference to claims 15 and 16, neither Shimizu, Teramoto, nor any combination of the two describes or suggests forming the first amorphous semiconductor film recited in claims 15 and 16. Maekawa does not remedy the deficiencies of Shimizu and Teramoto. Maekawa describes a method for annealing an amorphous silicon film using nickel to help induce crystallization. Maekawa, however, does not describe or suggest forming an amorphous semiconductor film that includes silicon and germanium, wherein the germanium is concentrated within a range of 0.1 atom% to 10 atom%, as recited in claim 15. Maekawa also does not describe or suggest forming an amorphous semiconductor film that includes silicon and an element having a larger atomic radius than silicon, wherein the element is concentrated within a range of 0.1 atom% to 10 atom%, as recited in claim 16. Accordingly, for at least these reasons, applicant requests reconsideration and withdrawal of the rejection of claims 18 and 30.

Independent claims 5, 6, 15 and 16, and dependent claims 7, 19 and 31, have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 7, 50-51, 59-60, and 66 of U.S. Patent No. 6,482,684 (the '684 patent).

Claims 5, 6, and 15 recite a method of manufacturing a semiconductor device including the step of "forming a first amorphous semiconductor film comprising *silicon and germanium*" such that "a concentration of germanium is within a range of *0.1 atom% to 10 atom%*" (emphasis added). Applicant requests reconsideration and withdrawal of the double-patenting rejection of claims 5, 6, and 15 and their dependent claims 7 and 19 because the claims of the '684 patent do not describe or suggest the step of forming an amorphous silicon and germanium film including germanium at the specified concentration range.

Claim 16 recites a method of manufacturing a semiconductor device including the step of "forming a first amorphous semiconductor film including silicon and an element having a larger atomic radius than silicon on an insulating surface wherein a concentration of said element is within a range of 0.1 atom% to 10 atom%." Applicant requests reconsideration and withdrawal of the double-patenting rejection of claim 16 and its dependent claim 31 because the claims of the '684 patent do not describe or suggest forming a silicon film containing such an element at the specified concentration range.

Applicants submit that all claims are in condition for allowance.

Enclosed is a $420 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 1/23/04

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